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09/851,284	05/08/2001	Sanja Durinovic-Johri	1999-0647	3417

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Samuel H. Dworetsky
AT&T CORP.
P.O. Box 4110
Middletown, NJ 07748-4110

EXAMINER	
DAVIS, CYNTHIA L	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,284	DURINOVIC-JOHRI ET AL.	
	Examiner	Art Unit	
	Cynthia L Davis	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1, 6, 8, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of these claims recites the limitation "the eligibility marker not directly related to congestion." The eligibility marker in each of these claims is used for overflow routing, which is directly related to congestion. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda in view of Rochberger.

Regarding claim 1, Switching, upon detection of congestion on one of the output ports, output of the eligible data packet from a primary output path of the one of the output ports corresponding to a destination address of the eligible data packet to an overflow path for the destination address is disclosed in Masuda,

figure 1, element 11 and column 4, lines 4-12. Determining that a data packet from a plurality of data packets is eligible for overflow routing, based upon an eligibility marker stored in the router, the eligibility marker not directly related to congestion, wherein not all data packets from the plurality of data packets are eligible for overflow routing is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, a router storing eligibility for rerouting that is based on the class of service of the packets. It would have been obvious to one skilled in the art to base eligibility for rerouting on QoS in the system of Masuda. The motivation would be to reroute higher priority traffic first, to ensure its particular guaranteed QoS.

Regarding claim 2, detecting when congestion has abated is disclosed in Masuda at figure 1, element 14. Switching the output of data from the overflow path back to the primary path for the destination address is disclosed in Masuda, figure 1, element 11 and column 5, lines 46-47 (the path selection unit switches the optimum path on a real time basis, so that when the congestion status monitor detects that congestion has abated, the path selection unit will switch back to the original optimum path).

Regarding claim 3, storing a forwarding table in the router is disclosed in Masuda, figure 1, elements 131 and 132. The information in the routing table together with the tree table make up a forwarding table for the network, containing information regarding destination addresses in the network (column 5, lines 36-7), and identifying at least two output paths from the router for at least some of the destination addresses (the H/W table holds whichever optimum path

has been selected based on the instant congestion levels; sometimes it will be the usual optimum path, sometimes it will not. Masuda, column 8, lines 4-7).

Regarding claim 4, determining, upon detection of congestion of one of the output ports, which one of the at least two overflow paths from which to output the data based upon an amount of data currently assigned to be output from each of the at least two overflow paths is disclosed in Masuda, figure 1, element 12 and column 8, lines 30-36 (if buffer overflow occurs, a portion of the data will be temporarily rerouted to another path not containing any congested links).

Regarding claim 5, determining the amount of data currently assigned to be output from each of the at least two output paths, determining which one of the at least two overflow paths has the least amount of data to be output, and assigning the data to be output from the at least one of the overflow paths having the least amount of data to be output is disclosed in Masuda, figure 1, element 12 and column 8, lines 30-36 (if buffer overflow occurs, a portion of the data will be temporarily rerouted to another path not containing any congested links).

Regarding claim 6, monitoring receipt of congestion signals from at least two transmit buffers respectively associated with at least two output ports of the router is disclosed in Masuda, figure 1, element 14. Switching, for all of the destination addresses in the forwarding table affected by the detection of congestion and eligible for overflow routing, from the primary path to one of the overflow paths for transmitting the data is disclosed in Masuda, figure 1, element 11 and column 4, lines 4-12. Determining that a destination address from the

destination addresses in the network is eligible for overflow routing based upon an eligibility marker stored in the router, the eligibility marker not directly related to congestion, wherein not all of the destination addresses in the network are eligible for overflow routing is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, a router storing eligibility for rerouting that is based on the class of service of the packets. It would have been obvious to one skilled in the art to base eligibility for rerouting on QoS in the system of Masuda. The motivation would be to reroute higher priority traffic first, to ensure its particular guaranteed QoS.

Regarding claim 7, determining when the congestion has abated based upon status of the congestion signals is disclosed in Masuda, figure 1, element 14. Switching for all of the destination addresses in the forwarding table switched to overflow routing from the overflow path back to the primary path when the congestion has abated is disclosed in Masuda, figure 1, element 11 and column 5, lines 46-47 (the path selection unit switches the optimum path on a real time basis, so that when the congestion status monitor detects that congestion has abated, the path selection unit will switch back to the original optimum path).

Regarding claim 8, storing a forwarding table in the router is disclosed in Masuda, figure 1, elements 131 and 132. The information in the routing table together with the tree table make up a forwarding table for the network, containing information regarding destination addresses in the network (column 5, lines 36-7), and identifying at least two output paths from the router for at least

some of the destination addresses (the H/W table holds whichever optimum path has been selected based on the instant congestion levels; sometimes it will be the usual optimum path, sometimes it will not. Masuda, column 8, lines 4-7). Monitoring receipt of congestion signals from at least two transmit buffers respectively associated with at least two output ports of the router is disclosed in Masuda, figure 1, element 14. Switching for all of the destination addresses in the forwarding table affected by the detection of congestion and eligible for overflow routing from the primary path to the overflow path for transmitting the data is disclosed in Masuda, figure 1, element 11 and column 4, lines 4-12. Determining that a destination address from the destination addresses in the network is eligible for overflow routing based upon an eligibility marker stored in the router, the eligibility marker not directly related to congestion, wherein not all of the destination addresses in the network are eligible for overflow routing is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, a router storing eligibility for rerouting that is based on the class of service of the packets. It would have been obvious to one skilled in the art to base eligibility for rerouting on QoS in the system of Masuda. The motivation would be to reroute higher priority traffic first, to ensure its particular guaranteed QoS.

Regarding claim 9, determining when congestion has abated based upon status of the congestion signals is disclosed in Masuda at figure 1, element 14. Switching for all of the destination addresses in the forwarding table switched to overflow routing, from the overflow path back to the primary path when the congestion has abated is disclosed in Masuda, figure 1, element 11 and column

5, lines 46-47 (the path selection unit switches the optimum path on a real time basis, so that when the congestion status monitor detects that congestion has abated, the path selection unit will switch back to the original optimum path).

Regarding claim 10, running a routing protocol on a router is disclosed in Masuda, column 5, line 38. Determining at least two output paths for each of a plurality of destination addresses based upon the routing protocol is disclosed in Masuda, figure 1, element 11. Storing, for each of the addresses eligible for overflow routing, the at least 2 output paths is disclosed in figure 1, element 82, and column 8, lines 26-35. Determining which of the destination address are eligible for overflow routing based upon an eligibility marker stored in the router, the eligibility marker not directly related to congestion, wherein not all of the destination addresses in the network are eligible for overflow routing is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, a router storing eligibility for rerouting that is based on the class of service of the packets. It would have been obvious to one skilled in the art to base eligibility for rerouting on QoS in the system of Masuda. The motivation would be to reroute higher priority traffic first, to ensure its particular guaranteed QoS.

Regarding claim 11, storing, for each of the destination addresses other than the destination addresses eligible for overflow routing, one output path is disclosed in Masuda, figure 1, element 82 and column 8, lines 26-35.

Regarding claim 12, monitoring congestion status on each output port of the router is disclosed in Masuda, figure 1, element 14. Switching, upon detection of congestion on one of the output ports output of data from a primary

output path of the one of the output ports corresponding to a destination address of the data to be output to an overflow path for the destination address is disclosed in Masuda, figure 1, element 11 and column 4, lines 4-12.

Regarding claim 13, detecting when congestion has abated is disclosed in Masuda, figure 1, element 14. Switching the output of data from the overflow path back to the primary path for the destination address is disclosed in Masuda, figure 1, element 11 and column 5, lines 46-47 (the path selection unit switches the optimum path on a real time basis, so that when the congestion status monitor detects that congestion has abated, the path selection unit will switch back to the original optimum path).

Regarding claim 14, monitoring congestion status on each output port of the router, wherein the congestion status is one of a plurality of levels of congestion is disclosed in Masuda, figure 1, element 14. Determining the amount of predetermined data packets to be overflowed based upon the level of congestion is disclosed in Masuda, figure 1, element 12 and column 8, lines 30-36 (if buffer overflow occurs, a portion of the data will be temporarily rerouted to another path not containing any congested links). Switching, upon detection of the one of the plurality of levels of congestion on the at least one output port, the amount of predetermined data packets to be overflowed from a primary output path of the at least one output port corresponding to a destination address of the data to be output to an overflow path for the destination address is disclosed in Masuda, figure 1, element 11 and column 4, lines 4-12. Determining that predetermined data packets are eligible for overflow routing, based upon an

eligibility marker stored in the router, the eligibility marker not directly related to congestion, wherein not all data packets are eligible for overflow routing is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, a router storing eligibility for rerouting that is based on the class of service of the packets. It would have been obvious to one skilled in the art to base eligibility for rerouting on QoS in the system of Masuda. The motivation would be to reroute higher priority traffic first, to ensure its particular guaranteed QoS.

Regarding claim 15, detecting the level of congestion has abated is disclosed in Masuda, figure 1, element 14. Switching the output of the at least one output port from the overflow path back to the primary path is disclosed in Masuda, figure 1, element 11 and column 5, lines 46-47 (the path selection unit switches the optimum path on a real time basis, so that when the congestion status monitor detects that congestion has abated, the path selection unit will switch back to the original optimum path).

Regarding claim 16, storing a forwarding table in the router is disclosed in Masuda, figure 1, elements 131 and 132. The information in the routing table together with the tree table make up a forwarding table for the network, containing information regarding destination addresses in the network (column 5, lines 36-7), and identifying at least two output paths from the router for at least some of the destination addresses (the H/W table holds whichever optimum path has been selected based on the instant congestion levels; sometimes it will be the usual optimum path, sometimes it will not. Masuda, column 8, lines 4-7). Storing, for each of the at least some of the destination addresses, a plurality of

overflow data amounts respectively corresponding to the plurality of levels of congestion is disclosed in Masuda, figure 1, element 12 and column 8, lines 30-36 (if buffer overflow occurs, a portion of the data will be temporarily rerouted to another path not containing any congested links. The amount of data overflowed based on the congestion will be present in the memory of the optimizing unit at some point).

Regarding claim 17, collecting link state advertisements from other routers in the network, wherein the link state advertisements are adapted for use in the determining at least two outlet paths step, and constructing a graph in the router using the link state advertisements is disclosed in column 4, lines 33-34 of Masuda (the monitor cells are link state advertisements) and column 4, lines 20-25 and 28-32 (the congestion information is used to determine the least-cost paths; this information may be considered to be in graph form).

Regarding claim 18, prioritizing the at least two output paths is disclosed in Masuda, column 4, lines 6-12 (many possible paths are calculated, and the best one is selected as optimum). The prioritizing being based on possible IP packet priorities is missing from Masuda. However, Rochberger discloses in column 11, lines 46-48, deciding which route packets will be sent on based on QoS. It would have been obvious to one skilled in the art at the time of the invention to reroute the packets on the various alternate paths based on their priorities. The motivation would be to reroute higher priority traffic on a less congested path, to ensure its particular guaranteed QoS.

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda in view of Rochberger in further view of Ofek. Encapsulating an IP packet according to an MPLS protocol, the IP packet adapted to be routed on one of the at least two output paths is missing from Masuda. However, Ofek discloses in column 3, lines 8-15, a network using MPLS encapsulation. It would have been obvious to one skilled in the art at the time of the invention to use the MPLS protocol in the system of Masuda. The motivation would be to replace the destination address with a short tag, thereby shortening the packet to improve throughput.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda in view of Rochberger in further view of Bentall. Determining the at least two output paths step uses a K-diverse shortest path algorithm is missing from Masuda and Rochberger. However, Bentall discloses in column 1, lines 47-49, use of a k-shortest paths algorithm form rerouting. It would have been obvious to one skilled in the art at the time of the invention to use a K-diverse shortest path algorithm in the system of Masuda. The motivation would be to use a known algorithm (Bentall, column 1, line 43).

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is

filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLD
3/28/2005

CLD
3/28/05

ALPUS H. HSU
PRIMARY EXAMINER